

Applicant: Wurz et al.
Application No.: 09/766,815

IN THE CLAIMS

Please cancel claims 2-27, without disclaimer, and add new claims 28-46. A complete listing of the claims of this application follow.

Claims 1-27 (Cancelled).

Claim 28 (New): An apparatus for measuring an object on a support surface comprising:

- a chassis;
- a rotatable, multifaceted mirror wheel located on the chassis;
- a light source located on the chassis to selectively strike a facet of the mirror wheel;
- a reflective surface located on the chassis at a known distance from the support surface, the reflective surface receives light reflected from the selected facet of the mirror wheel, directs that light toward an object on the support surface, receives light reflected from the object and directs it back to the selected facet which redirects the reflected light;
- a detector located on the chassis with a field of detection that includes the selected facet, detects redirected light from the selected facet and outputs a signal that identifies a point of contact with the object; and
- a processor that receives the signal and establishes a measurement of

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distance between the support surface and the point of contact with the object.

Claim 29 (New): The apparatus of claim 28, wherein the reflective surface is parabolic with a concave light receiving side that reflects the light toward the support surface at a predetermined nonzero angle relative to a perpendicular extending from the support surface.

Claim 30 (New): The apparatus of claim 28, wherein the light source emits a light beam at a fixed orientation relative to the chassis that is converted to a moving light beam by the mirrored wheel such that when the moving light beam leaves the mirrored wheel toward the reflective surface, the moving light beam rotatably sweeps through an arc of a circle, the reflecting surface changing the moving light beam from sweeping rotatably through the arc of a circle to another type of moving light beam that moves laterally through a plane, when the object is positioned on the support surface, the other moving light beam moves across the support surface and the detector registers a plurality of points of contact along the object.

Claim 31 (New): The apparatus of claim 30, wherein the reflective surface is fixed in position and directs the light toward the support surface at a nonzero angle

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relative to a perpendicular thereto.

Claim 32 (New): The apparatus of claim 31, wherein the field of view which intersects the support surface remains centered about the perpendicular.

Claim 33 (New): The apparatus of claim 31, wherein the light source and the detector are oriented toward the selected facet of the mirrored wheel and positioned offset from each other by an angle of less than ninety (90) degrees.

Claim 34 (New): The apparatus of claim 30, wherein the light source and the detector are oriented toward the selected facet of the mirrored wheel and positioned offset from each other by an angle of less than forty-five (45) degrees.

Claim 35 (New): The apparatus of claim 30, wherein the processor calculates a height value for each of the plurality of points of contact, stores data from the plurality of points of contact, and compares the data to provide a three dimensional measurement of an object on the supporting surface.

Claim 36 (New): The apparatus of claim 35, wherein the supporting surface is a conveyor.

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Claim 37 (New): The apparatus of claim 30, wherein the detector is a line scan camera that transmits a path-height-profile-measurement-signal which represents a height of the object along a linear section of the support area.

Claim 38 (New): The apparatus of claim 37, wherein the transport of the object on a conveyor which forms part of the support surface allows the path-height-profile-measurement-signal to be used to determine a height and width of the object.

Claim 39 (New): A method of measuring an object on a support surface, comprising:

emitting a fixed light beam in a fixed orientation toward a selected facet of a multifaceted, rotatable, mirrored wheel that reflects the fixed light beam as a moving light beam that rotatably sweeps through an arc of a circle;

redirecting the moving light beam using a reflective surface such that the rotatable sweeping of the moving light beam through an arc of a circle is converted to a modified moving light beam that moves laterally through a plane across the support surface;

detecting a plurality of points of contact that occur within a detector field of

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view, wherein the detector field of view and the fixed light beam are initially oriented directly toward and redirected by the selected facet of the mirrored wheel; and

calculating height data that corresponds to each of the plurality of points of contact to determine a height profile across a linear section of the measuring area.

Claim 40 (New): The method of claim 39, wherein the modified moving light beam impacts the support surface at an angle relative to a perpendicular thereto and the field of view impacts the support surface generally along the perpendicular.

Claim 41 (New): The method of claim 39, further comprising transporting the object on a conveyor which forms at least part of the support surface such that the modified moving light beam moves across the conveyor so that a detector can register a plurality of points of contact along the object and/or the support surface.

Claim 42 (New): The method of claim 41, further comprising storing data from the plurality of image points and comparing the data to provide a three dimensional measurement of the object in the measuring area.

Claim 43 (New): The method of claim 39, further comprising providing a light

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source and a detector that are oriented directly toward the selected facet along an unobstructed path and are offset from each other by an angle of less than ninety (90) degrees.

Claim 44 (New): The method of claim 43, wherein the step of providing the detector comprises providing a line scan camera that transmits a path-height-profile-measurement-signal which represents a height of the object along the linear section of the measuring area.

Claim 45 (New): The method of claim 44, further comprising determining if the path-height-profile-measurement-signal represents one or more objects.

Claim 46 (New): The method of claim 45, further comprising transmitting a signal corresponding to the number of objects identified by the path-height-profile-measurement-signal.